

METHOD AND MEANS FOR REDUCING STRESS
IN A PIVOT IRRIGATION PIPELINE

Your Petitioners, RICKY D. McGEE, a citizen of the United States and a resident of the State of Nebraska, whose post office address is 11214 South 213th Circle, Gretna, Nebraska 68028, and DALE A. CHRISTENSEN, a citizen of the United States and a resident of the State of Nebraska, whose post office address is 4451 County Road P11, Arlington, Nebraska 68002, pray that Letters Patent may be granted to them for the invention set forth in the following specification:

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

This invention relates to a method and means for reducing stress in a pivot irrigation pipeline and more particularly to a method and means for reducing stress in a pivot irrigation pipeline by allowing the pipeline to separate while maintaining the same in proper alignment to facilitate reconnection.

2. DESCRIPTION OF THE RELATED ART

Center pivot irrigation systems comprise a center pivot structure having an elongated water pipeline extending outwardly therefrom which is supported upon a plurality of spaced-apart drive towers. In many cases, the systems are quite long. During periods of non-use, when cooler temperatures are experienced, the long systems tend to contract which causes stress in the system which may result in component failure. If the pipeline is disconnected from the center pivot structure to reduce the stress in the system during periods of cooler temperatures, it is extremely

1 difficult to align the pipeline with respect to the center pivot structure to reconnect the same.

SUMMARY OF THE INVENTION

5 A method and means is described for reducing stress in a pivot irrigation system by allowing the pipeline to separate from the center pivot structure during periods of cooler temperatures. The instant invention includes an alignment assembly which is secured to and extends between the center pivot structure and inner end of the pipeline. When the pipeline is disconnected from the center pivot structure and cooler temperatures are experienced, the alignment assembly permits the system to contract along its length and maintains the inner end of the pipeline in alignment with the center pivot structure to facilitate reconnection of the same when the system is going to be used to irrigate.

15 It is therefore a principal object of the invention to provide a method and means for reducing stress in a pivot irrigation pipeline when cooler temperatures are experienced.

20 Yet another object of the invention is to provide a method and means for reducing stress in a pivot irrigation pipeline by allowing the pipeline to be separated from the center pivot structure while maintaining the same in alignment to facilitate subsequent reconnection.

Yet another object of the invention is to provide a novel method and means for reducing stress in a pipeline which may be easily retrofitted onto existing systems.

25 These and other objects will be apparent to those skilled in the art.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of the apparatus of this invention;

Figure 2 is a perspective view of the apparatus of this invention;

Figure 3 is a view similar to Figure 1 except that the pipeline has been disconnected from the center pivot structure and the pipeline has moved away from the center pivot structure; and

Figure 4 is a view similar to Figure 2.

DETAILED DESCRIPTION OF THE INVENTION

In Figure 1, the numeral 10 refers generally to a self-propelled pivot irrigation system including a center pivot structure 12 and an elongated water pipeline or boom 14 supported upon a plurality of spaced-apart drive towers in conventional fashion. Pivot structure 12 includes a vertically disposed pipe 18 which is in communication with a source of water. Normally, pipe 18 is provided with an elbow 20 at its upper end to define a horizontally extending pipe portion 22. Elbow 20 is rotatably secured, about a vertical axis, to the pipe 18 in conventional fashion. In most cases, pipe portion 22 has a flex joint assembly 24 at its outer end which connects the pipe portion 22 to the inner end of the pipeline 14 in a manner which permits the pipeline 14 to flex with respect to the pipe portion 22 as the system moves around the area being irrigated.

In the instant invention, an upstanding support 26 is bolted to the inner flange of the flex joint assembly 24 and extends upwardly therefrom. An elongated pivot tube or rod 28 is secured to the upper end of the support 26 and extends therefrom over

1 the inner end of the pipeline 14 (Figure 2). Support 30 is clamped or otherwise
secured to the inner end of the pipeline 14 and has a pair of upstanding brackets 32
and 34 secured thereto. Bracket 32 has upper and lower rollers 36 and 38 rotatably
mounted thereon which receive the rod 28 therebetween. Similarly, bracket 34 has
5 upper and lower rollers 40 and 42 rotatably mounted thereon which receive the rod 28
therebetween. In normal use, the flange 44 on the inner end of pipeline 14 is bolted to
the flange 46 on the outer end of the flex joint 24.

If the flanges 44 and 46 remain connected during periods of cooler weather,
10 contraction of the system may cause stress in the machine resulting in possible
component failure. The instant invention permits the inner end of the pipeline 14 to be
disconnected from the pivot structure 12 during periods of cooler temperatures while
permitting the pipeline 14 to be easily reconnected to the pivot structure when the
machine is going to be used to irrigate. If cooler weather is anticipated, the flanges 44
15 and 46 are disconnected (Figure 3). As the machine contracts due to the cooler
temperatures, the invention allows the system to move linearly along its length. As the
system moves linearly along its length, the interaction of the rod 28 with the rollers on
the brackets 32 and 34 maintains the inner end of the pipeline 14 in alignment with the
20 pipe portion 22 (Figures 3, 4). As temperatures increase, the machine moves linearly
along its length so that the inner end of the pipeline 14 moves into registering
alignment with the outer end of the flex joint 24 which facilitates the reconnection of
the flanges 44 and 46. If a space exists between the flanges 44 and 46, a "come-a-

1 long" or similar tool may be used to manually bring the flanges 44 and 46 together to
reconnect the same.

Thus it can be seen that the invention provides a method and means for
reducing the stress in an irrigation system during periods of cooler temperatures
5 thereby preventing component failures in the system. The instant invention therefore
accomplishes at least all of its stated objectives

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